AMENDMENTS TO THE CLAIMS

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A chemical vapor deposition system for forming an aluminide coating containing at least two different extrinsic metals on a jet engine component, comprising:

a main reaction chamber adapted to hold ~~and heat~~ said jet engine component and to create a deposition environment, when heated, containing a first vapor phase reactant including a first extrinsic metal;

~~a source of a first vapor phase reactant containing a first extrinsic metal; and~~

a ~~heated~~ first receptacle external of the main reaction chamber and adapted to ~~hold a second donor material~~ provide, when heated, a second vapor phase reactant including a second extrinsic metal, the first receptacle sealed but for a first closed communication path that permits passive transport of [[a]] the second vapor phase reactant ~~containing the second extrinsic metal from the second donor material~~ to the main reaction chamber, the first and second extrinsic metals combining at said jet engine component to form said aluminide coating.

2. (Currently Amended) The chemical vapor deposition system of claim 1 wherein the source of the first vapor phase reactant comprises:

first and second containers positioned in the ~~reactor~~ main reaction chamber and respectively ~~holding~~ adapted to hold an activator material and a first donor material including the first extrinsic metal; and

a heater positioned to heat the main reaction chamber to vaporize the activator material, the activator material reacting chemically with the first donor material to provide the first vapor phase reactant.

3. (Currently Amended) The chemical vapor deposition system of claim 1 wherein the source of the first vapor phase reactant comprises:

a heated precursor source outside of the main ~~reactor~~ reaction chamber and holding a precursor containing the first extrinsic metal, the precursor releasing the first vapor phase reactant when heated; and

a carrier gas supply coupled in fluid communication with the precursor source, the carrier gas supply providing a flow of carrier gas that transports the first vapor phase reactant to the main reaction chamber.

4. (Currently Amended) The chemical vapor deposition system of claim 1 further comprising:

a heater positioned to heat the first receptacle for providing the second vapor phase reactant from a second donor material positioned inside the first receptacle.

5. (Currently Amended) The chemical vapor deposition of claim 4 wherein the ~~heated~~ first receptacle has a single receptacle port coupled in closed fluid communication with the main reaction chamber.

6. (Currently Amended) The chemical vapor deposition of claim 5 further comprising:

a conduit having only two normally open apertures, one of the apertures being coupled to the receptacle port and the other of the apertures being coupled in fluid communication with the main reaction chamber, the second vapor phase reactant being transported through the conduit to the main reaction chamber so that the second extrinsic metal ~~combining~~ combines chemically with the first extrinsic metal to apply the aluminide coating on said jet engine component.

7. (Original) The chemical vapor deposition system of claim 6 wherein the heater is further positioned to heat the conduit.

8. (Currently Amended) The chemical vapor deposition system of claim 1 further comprising:

a ~~heated~~ second receptacle external of the main reaction chamber and adapted to hold a third donor material including a third extrinsic metal, the second receptacle sealed but for a second closed communication path that permit passive transport of a third vapor phase reactant containing the third extrinsic metal from the third donor material to the main reaction chamber.

9. (Currently Amended) The chemical vapor deposition system of claim 1 further comprising:

a ~~heated~~ second receptacle external of the main reaction chamber and adapted to hold a third donor material including a third extrinsic metal, the second receptacle sealed but being coupled with the first closed communication path to ~~that~~ permit passive transport of a third vapor phase reactant containing the third extrinsic metal from the third donor material to the main reaction chamber.

10. (Currently Amended) The chemical vapor deposition system of claim 1 wherein the main reaction chamber is dimensioned for receiving said jet engine component, and a first volume of the main reaction chamber is larger ~~volumetrically~~ than a second volume of the first receptacle.

11. (Currently Amended) The chemical vapor deposition system of claim 1 wherein [[a]] said first volume ~~of the main chamber~~ is at least ten times larger than [[a]] said second volume ~~of the first receptacle~~.

12. (Currently Amended) A simple chemical vapor deposition system for forming an aluminide coating containing at least two different extrinsic metals on a jet engine component, comprising:

a main reaction chamber adapted to hold said jet engine component, an activator material, and a first donor material including a first extrinsic metal;

a first heater positioned to heat the main reaction chamber to vaporize the activator material, the activator material reacting chemically with the first donor material to provide a first vapor phase reactant containing the first extrinsic metal;

a receptacle external to the main reaction chamber and having a single receptacle port coupled in closed fluid communication with the main reaction chamber, the receptacle adapted to hold a second donor material including a second extrinsic metal;

a conduit having only two normally open apertures, one of the apertures being coupled to the receptacle port and the other of the apertures being coupled in fluid communication with the main reaction chamber; and

a second heater positioned to heat the receptacle for providing a second vapor phase reactant containing the second extrinsic metal through the conduit to the main reaction chamber, the second extrinsic metal combining with the first extrinsic metal to [[apply]] form the aluminide layer on said jet engine component.

13. (Currently Amended) The simple chemical vapor deposition system of claim 10 wherein the receptacle is mechanically supported by the main reaction chamber.

14. (Currently Amended) The simple chemical vapor deposition system of claim 13 wherein the main reaction chamber includes a vessel and a lid removable from the vessel, and the receptacle is mechanically supported by the lid.

15. (Currently Amended) The simple chemical vapor deposition system of claim 12 further comprising:

an inlet port and a discharge port associated with the main reaction chamber, the inlet port configured to receive an inert gas and the discharge port configured for evacuating the main reaction chamber, whereby to cooperatively purge reactive gases from the main reaction chamber.

16. (Currently Amended) The simple chemical vapor deposition system of claim 12 wherein the conduit is a pipe fluidly coupling an interior environment of the receptacle with an interior deposition environment of the reaction main chamber.

17. (Original) The simple chemical vapor deposition system of claim 16 wherein at least one of said first heater and said second heater transfer heat to the pipe.

18. (Original) The simple chemical vapor deposition system of claim 16 wherein the pipe is a tee fitting.

19. (Original) The simple chemical vapor deposition system of claim 12 wherein the receptacle is free of fluid communication with a source of a carrier gas.

20. (Original) The simple chemical vapor deposition system of claim 12 wherein the receptacle is free of fluid communication with a source of a corrosive gas.

21. (Currently Amended) The chemical vapor deposition system of claim 12 wherein the main reaction chamber is dimensioned for receiving said jet engine component, and a first volume of the main reaction chamber is larger ~~volumetrically~~ than a second volume of the first receptacle.

22. (Currently Amended) The chemical vapor deposition system of claim 21 wherein [[a]] said first volume ~~of the main chamber~~ is at least ten times larger than [[a]] said second volume ~~of the first receptacle~~.

23. (Currently Amended) A chemical vapor deposition system for forming a coating on a jet engine component, comprising:

a main reaction chamber adapted to hold said jet engine component, a first mass of activator material, and a donor material including an extrinsic metal;

a heater positioned to heat the main reaction chamber to vaporize the first mass of activator material; and

a ~~heated~~ receptacle external of the main reaction chamber and adapted to hold a second mass of activator material, the receptacle sealed but for a first closed communication path that permits passive transport to the main reaction chamber of vaporized activator material released by heating the second mass of activator material, wherein vaporized activator material released from the first and second masses of activator material react chemically with the donor material to provide a vapor phase reactant containing the extrinsic metal for deposition as said coating on said jet engine component.

24. (Currently Amended) A deposition method for forming an aluminide coating containing at least two different extrinsic metals on a jet engine component, comprising:

passively coupling a single port of a receptacle in fluid communication with a main reaction chamber;

providing a first vapor phase reactant including a first extrinsic metal from the receptacle to the main reaction chamber;

generating a second vapor phase reactant including a second extrinsic metal inside the main reaction chamber, the second extrinsic metal differing in composition from the first extrinsic metal;

heating the jet engine component; and

contacting the first and second vapor phase reactants with the heated jet engine component to form [[an]] the aluminide layer including the first and the second extrinsic metals, wherein the aluminide layer is capable of forming a complex oxide when heated in an oxidizing environment.

25. (Original) The deposition method of claim 24 wherein the first metal originates from a metal-halogen Lewis acid.

26. (Currently Amended) The deposition method of claim 25 wherein the second extrinsic metal is aluminum and the first extrinsic metal is selected from the group consisting of ~~chromium, zirconium, yttrium, hafnium, aluminum, platinum, palladium, rhodium, iridium, titanium, niobium, silicon and cobalt~~ aluminum, chromium, cobalt,

hafnium, iridium, niobium, palladium, platinum, rhodium, silicon, titanium, yttrium, and zirconium.

27. (Original) The deposition method of claim 26 wherein the metal-halogen Lewis acid is provided as a hydrated or anhydrous solid compound.

28. (Original) The deposition method of claim 25 wherein the metal-halogen Lewis acid is selected from the group consisting of $AlCl_3$, $CoCl_4$, $CrCl_3$, CrF_3, $FeCl_3$, $HfCl_3$, $IrCl_3$, $PtCl_4$, $RhCl_3$, $RuCl_3$, $TiCl_4$, YCl_3, $ZrCl_4$, and ZrF_4.

29. (Original) The deposition method of claim 24 wherein the jet engine component is fabricated from a superalloy.

30. (Original) The deposition method of claim 24 wherein the second metal constitutes less than 10 wt.% of the aluminide layer.

31. (Original) The deposition method of claim 24 wherein providing the first vapor phase reactant is free of a flow of a carrier gas into the receptacle.

32. (Currently Amended) A method of retrofitting a receptacle to an existing simple chemical vapor deposition reaction chamber to permit coating a jet engine component with at least two different metals, comprising:

positioning a receptacle outside an existing simple chemical vapor deposition reaction chamber;

sealingly coupling one of a pair of normally open apertures of a conduit for fluid communication with a single receptacle port of the receptacle to define a closed communication path; and

sealingly coupling another of the pair of normally open apertures for fluid communication with the simple chemical vapor deposition reaction chamber such that the simple chemical vapor deposition reaction chamber and receptacle constitute a closed space sharing a common deposition environment.

33. (Original) The retrofitting method of claim 32 wherein positioning the receptacle further comprises mechanically supporting the receptacle with the reaction chamber.

34. (Currently Amended) A deposition process comprising:

placing a metal component in a deposition environment in a main reaction chamber;

providing a first source of a first extrinsic metal independent of the metal component in the main reaction chamber;

providing a second source of a second extrinsic metal to the main reaction chamber via a closed pathway from an external receptacle without a carrier gas; and

while the metal component is in the main reaction chamber, exposing the metal component, the independent first source and the external second source to a deposition

environment in the main reaction chamber for a time sufficient to form an aluminide layer at the metal component including the first and the second extrinsic metals.

35. (Currently Amended) The deposition process of claim 34 wherein providing the first source further comprises:

placing an activator material and a donor material containing the first extrinsic metal into the main reaction chamber; and

reacting the activator material with the first donor material to provide the first source.

36. (Original) The deposition process of claim 35 wherein reacting the activator material further comprises:

heating the activator material sufficiently to cause migration of the activator material to the first donor material and to cause a chemical reaction releasing the first source.

37. (Currently Amended) The deposition process of claim 34 wherein providing the first source further comprises:

transporting a vapor containing the first source to the main reaction chamber in a flow of carrier gas.

38. (New) A chemical vapor deposition system for forming a coating on a jet engine component, comprising:

a main reaction chamber adapted to hold a jet engine component and to create a deposition environment, when heated, to facilitate forming a coating on the jet engine component in which a first vapor phase reactant and a second vapor phase reactant, at least one of which contains a first extrinsic metal, cooperate to form the coating containing the first extrinsic metal on the jet engine component; and

a receptacle external of the main reaction chamber adapted to hold a source of the first vapor phase reactant, the receptacle communicating with the deposition environment of the main reaction chamber via a communication path so as to share the deposition environment of the main reaction chamber and to permit passive transport of the first vapor phase reactant from the receptacle to the main reaction chamber, receptacle being sealed but for the communication path that is otherwise closed.

39. (New) The chemical vapor deposition system of claim 38 wherein the communication path is defined by a conduit having a first aperture coupled in fluid communication with the receptacle and a second aperture coupled in fluid communication with the main reaction chamber.

40. (New) The chemical vapor deposition system of claim 39 wherein the receptacle has a single receptacle port coupled in closed fluid communication with the first aperture of the conduit.

41. (New) The chemical vapor deposition system of claim 39 wherein the conduit is a pipe fluidly coupling the deposition environment of the main reaction chamber with the receptacle.

42. (New) The chemical vapor deposition system of claim 39 wherein the conduit is a tee fitting fluidly coupling the deposition environment of the main reaction chamber with the receptacle.

43. (New) The chemical vapor deposition system of claim 38 wherein the first vapor phase reactant contains the first extrinsic metal, the second vapor phase reactant contains a second extrinsic metal differing in composition from the first extrinsic metal, and the coating includes the first and second extrinsic metals.

44. (New) A deposition method for forming a coating on a jet engine component, comprising:

placing the jet engine component in a deposition environment in a main reaction chamber adapted to hold the jet engine component on which the coating is to be formed;

providing a first vapor phase reactant including a first extrinsic metal independent of the jet engine component in the deposition environment inside the main reaction chamber;

heating the jet engine component;

passively coupling a second vapor phase reactant from a receptacle external to the main reaction chamber to the deposition environment inside the main reaction chamber via a closed first communication path with the main reaction chamber while the heated jet engine component is in the main reaction chamber; and

forming the coating including the first extrinsic metal on the heated jet engine component by cooperation between the first vapor phase reactant and the second vapor phase reactant.

45. (New) The deposition method of claim 44 wherein the second vapor phase reactant includes a second extrinsic metal differing in composition from the first extrinsic metal.

46. (New) The deposition method of claim 44 wherein forming the coating further comprises:

contacting the first and second vapor phase reactants with the heated jet engine component for a time sufficient to form the coating including the first and second extrinsic metals on the jet engine component.

47. (New) The deposition method of claim 44 further comprising:

coupling a single port of the receptacle in fluid communication with the main reaction chamber, the receptacle being sealed but for the first communication path that is otherwise closed.